

# PATENT ABSTRACTS OF JAPAN

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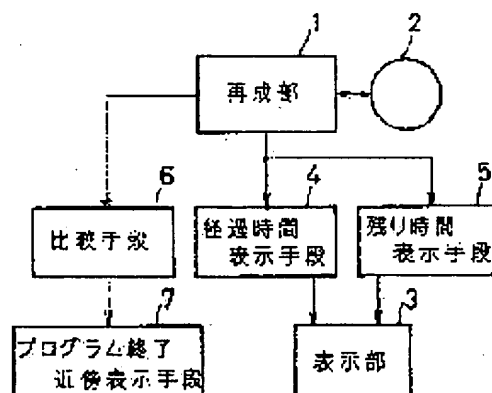
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## (54) RECORDING MEDIUM REPRODUCING DEVICE

### (57)Abstract:

PURPOSE: To recognize that the end of a program is close at hand, without changing over a display mode even in the state reproducing an elapse time display mode, and to improve a handleability.

CONSTITUTION: The time is displayed on a time display part 3. By an elapse time display means 4, the reproducing elapse time from the start position of the program under reproduction is displayed on the time display part from a reproduction time information. By a remaining time display means 5, the remaining time of reproduction up to the end position of the program under reproduction is displayed on the time display part from the reproduction time information. By a comparison means 6, the remaining time is compared with a prescribed time set beforehand, in the reproducing state displaying the elapse time on the time display part. By a display means 7 for vicinity of program end, the display is made when the remaining time becomes less than the prescribed time in the comparison result of the comparison means.



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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the time amount means of displaying of the record-medium regenerative apparatus which reproduces the record medium with which the hour entry was recorded with the main information on a program about the time amount means of displaying of a record-medium regenerative apparatus.

[0002]

[Description of the Prior Art] The time amount which playback [ location / of each music (program) / recording start ] takes is recorded on CD (compact disk) with the music as main information, in the CD player which plays this CD, the elapsed time display mode which displays the elapsed time from the starting position of the music which is carrying out the playback performance, and the residual time display mode which displays the residual time of the music currently performed are switched if needed, and the time amount display is performed.

[0003]

[Problem(s) to be Solved by the Invention] In the conventional CD player, elapsed time or residual time is displayed on the display. For this reason, at the time of playback of an elapsed time display mode, it could not know how much the residual time of that music was, but had to carry out whether for getting to know residual time, the total time amount of that music is kept in mind beforehand, or a display mode would be switched each time, and there was a problem of being user-unfriendly.

[0004] It can recognize that this invention was made in view of the above-mentioned point, and it became close ending [ of a program ] it, without switching a display mode even if it was in the playback condition of an elapsed time display mode, and aims at offering the record-medium equipment whose user-friendliness improves.

[0005]

[Means for Solving the Problem] Drawing 1 shows the principle Fig. of this invention.

[0006] The playback section 1 reproduces the record medium 2 with which the hour entry which playback takes from the starting position of a program with the main information on two or more programs was recorded among this drawing.

[0007] The time amount display 3 displays time amount.

[0008] The elapsed time display means 4 displays the elapsed time of the playback from the starting position of the program under playback on a time amount display from the reproduced hour entry.

[0009] The residual time display means 5 displays the residual time of playback from the reproduced hour entry to the termination location of the program under playback on a time amount display.

[0010] The comparison means 6 is in the playback condition which displayed elapsed time on the time amount display, and compares residual time with the predetermined time set up beforehand.

[0011] The display-near the program termination means 7 displays, when residual time becomes below predetermined time by the comparison result of a comparison means.

[0012]

[Function] In this invention, even if it is in the playback condition which shows elapsed time to the time amount display, if it consists of a termination location of a program less than predetermined time, a

-- display will be made by the display-near the program termination means, and it can recognize that program termination is close.

[0013]

[Example] Drawing 2 shows the block diagram of one example of the CD player of this invention method.

[0014] Various kinds of actuation keys are prepared in the key matrix 10 among this drawing, and the key stroke condition of this key matrix 10 is read by the key read station 11, and is supplied to the system control section 12.

[0015] The system control section 12 supplies the command which directs playback, a halt, a halt, song selection, etc. to the servo control section 14 according to the read key stroke.

[0016] The servo control section 14 controls the drive of the optical pickup in CD mechanism and a servo 15, a disk motor, etc. according to the command from the system control section 12. From this CD mechanism and the servo section 15, playback information, such as a tune number in the regenerative signal reproduced by the optical pickup, elapsed time, and residual time, is supplied to the servo control section 14, and this playback information is supplied to the system control section 12 and a display and control section 16 from the servo control section 14.

[0017] Display-control drawing 16 supplies the indicative data for displaying the indicative data and operating state for displaying a tune number, elapsed time, or residual time according to directions of the system control section 12 to the display mechanical component 17, and is made to display it on a display 18. LED which indicates each of operating state, such as a monitor condition which a display 18 does not output outside the 7 segment LED of 4 figures which displays the 7 segment LED of double figures (light emitting diode), elapsed time, or residual time which displays a tune number, a playback condition, a idle state, a halt condition, a song selection condition, the on-line state that outputs playback voice outside, and playback voice, but is outputted only to a monitor loudspeaker, by lighting is prepared.

[0018] Drawing 3 shows the flow chart of the timer-interruption routine which the system control section 12 performs. For every predetermined time of 30msec(s), this routine interrupts and is performed. Among this drawing, by step 30, operating state distinguishes whether it is a playback condition (play mode), and if it is in a playback condition, it will distinguish whether it is an on-line state at step 32. If it is an on-line state, it will distinguish whether it is an elapsed time display mode at step S34, if it is an elapsed time display mode, it will distinguish whether residual time is below predetermined time (for example, 30 seconds) at step S36, and when residual time is below predetermined time, the lighting flag of LED which displays an on-line state at step S38 distinguishes whether it is ON (value "1").

[0019] If a lighting flag is not ON at step 38, this will be switched to ON at step 40, processing will be ended, if a lighting flag is ON, this will be switched to OFF (value "0") at step 42, and processing will be ended.

[0020] Moreover, when residual time is over predetermined time at steps 30-36 or it is not in a playback condition, and it is not an on-line state, and is a residual time display mode and is not an elapsed time display mode, in each, processing is ended as it is.

[0021] A display and control section 16 will direct lighting of LED which displays the on-line state of a display 18, if the above-mentioned lighting flag is ON, and if a lighting flag is OFF, it will direct lighting of LED.

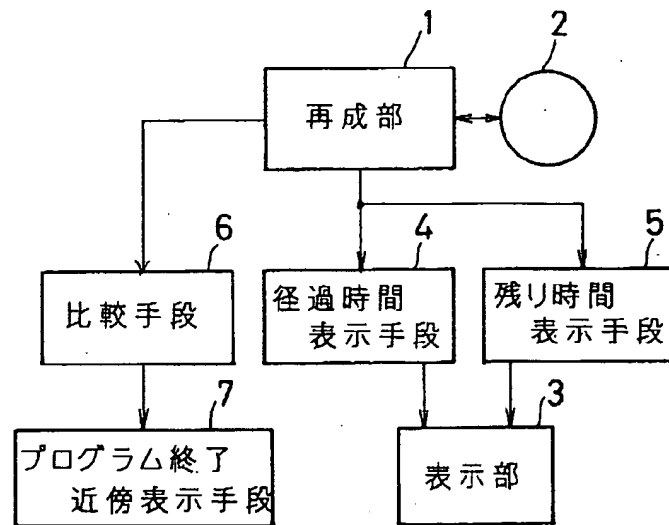
[0022] It is made to blink until display elapsed time by this at the 7 segment LED of 4 figures of a display 18 in the case where it is reproducing by the on-line state with the elapsed time display mode, it makes LED for the on-line state display of a display 18 into a lighting condition until residual time turns into predetermined time, i.e., 30 seconds, and residual time serves as zero after that and it ends a performance, and it expresses that the time amount to residual time, i.e., program end time, is slight.

[0023] In addition, since residual time is displayed on the 7 segment LED of 4 figures of a display 18 at the time of playback of a residual time display mode, flashing of LED for an on-line state display is not performed. However, this may blink LED like an elapsed time display mode.

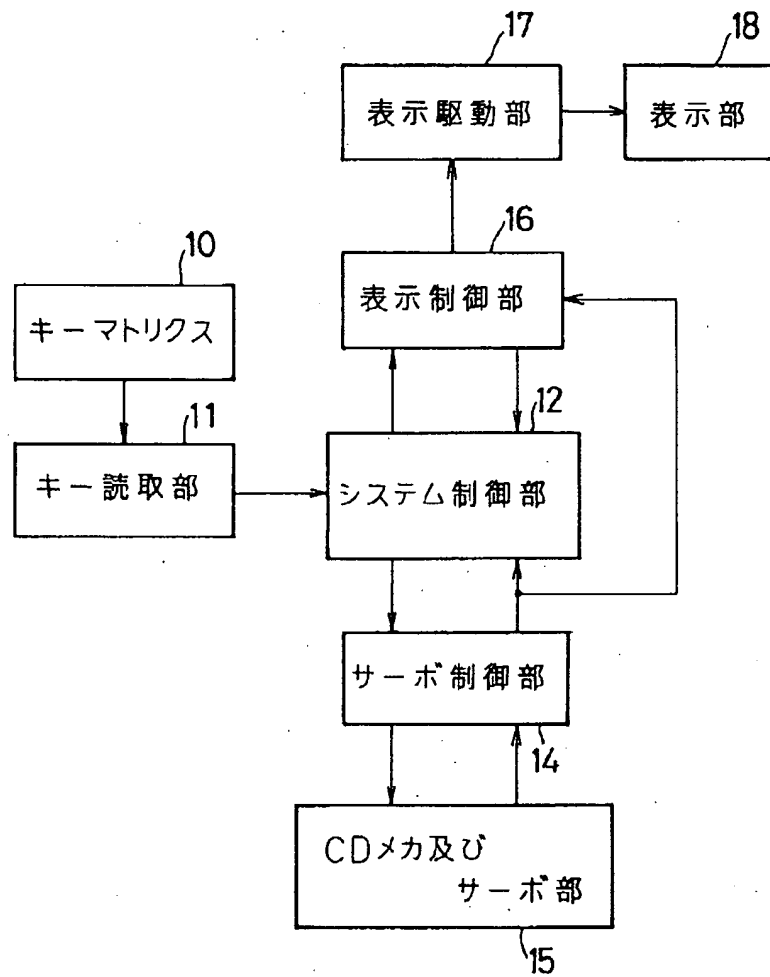
·[0024]

[Effect of the Invention] Termination of a program can recognize having become close, and user-friendliness's improves, without switching a display mode, even if it is in the playback condition of an elapsed time display mode like \*\*\*\* according to the record-medium regenerative apparatus of this invention, and it is very useful practically.

【図1】



【図2】



【図3】

